

Thermoelectrical Properties and Charge Carriers Transport in CuInSe₂ Films and CuInSe₂/CdS Films Geterostructures

M-R.A. Magomedov, Sh.M. Ismailov, J.Kh. Magomedova, and P.P. Khokhlachev

Dagestan Scientific Center of the Russian Academy of Sciences

367003 Makhachkala

Jaragского 94, Russia

The growing interest in thermoelectrical properties of CuInSe₂ is motivated by the prospect of developing new materials with technological applications such as composite films for photo- and thermoenergetics.

In this paper the results of study preparing and investigations thermoelectrical and electrical properties CuInSe₂ films and CuInSe₂/CdS films heterojunctions.

The films of Cu_{2-x}In_xSe₂ in the composition range $1.0 < x < 1.50$ were deposited by the quasi equilibrium evaporation technique on optically polished glass and mica substrates. The films thus deposited were found to have the same composition as that of the starting material. Concentration and mobility charge carriers in films n- and p-type at 300 K 2×10^{16} ; 80 and $3 \times 10^{15} \text{ cm}^{-3}$; $0.4 \text{ cm}^2/\text{vs}$ at $x = 1.32$ and 1.1 accordingly. Thermoemf at 300K change for difference films from -58 to $+320 \text{ } \mu\text{V/K}$.

P-n junction solar cells were produced on mica and glass substrates. P-type CuInSe₂ films were $2 \div 3 \mu\text{m}$ thick and were a base on which $0.5 \div 1 \mu\text{m}$ thick n-type CdS films were deposited. The ventill thermoemf measurement with stationary method in plane geometric. The magnitude thermoemf value exceed in specimens no keep barriers.